Applicant: Isamu Kobori et al. Attorney's Docket No.: 07977-024004

Serial No. : New Divisional application

Filed: Herewith Page: 2 of 10

#### Amendments to the Specification:

#### Beginning at page 1, line 2, please insert the following paragraph: CROSS-REFERENCE TO RELATED APPLICATION

This application is a divisional application of U.S. Application Serial No. 10/623,581, filed on July 22, 2003 which is a divisional of U.S. Application Serial No. 09/016,999, filed on February 2, 1998, now U.S. Patent No. 6,596,572, which is a divisional of U.S. Application Serial No. 08/623,506, filed on March 28, 1996, now U.S. Patent No. 5,767,529, which claims the benefit of a foreign priority application filed in Japan on March 28, 1995, as Serial No. 07-096266. This application claims priority to each of these prior applications, and the disclosures of the prior applications are considered part of (and are incorporated by reference in) the disclosure of this application.

### Please replace the paragraph beginning at page 3, line 20 as with the following amended paragraph:

Also, according to another aspect of the present invention, there is provided a thin-film transistor having an active silicon film which is formed of a plurality of island-like regions arranged in parallel to each other, each of said island-like regions being formed of a polycrystal silicon thin film having a plane area of  $1000 \, \mu m^2$  or less.

# Please replace the paragraph beginning at page 4, line 18 as with the following amended paragraph:

The present applicant has found that after the amorphous silicon thin film has been formed as island-like regions that have each has a plane area (an area viewed from an upper surface of the substrate) of  $1000 \ \mu m^2$  or less, it is subjected to an annealing process by heating or the irradiation of a laser light beam or an intense light to form a polycrystal silicon thin film with the result that a polycrystal silicon thin film which is low in defect density and high in quality is obtained.

Applicant: Isamu Kobori et al. Attorney's Docket No.: 07977-024004

Serial No.: New Divisional application

Filed : Herewith Page : 3 of 10

#### Please replace the paragraph beginning at page 5, line 2 as with the following amended paragraph:

Fig. 1 is a graph showing a relationship between a threshold voltage ( $V_{th}$ ) and an area of the island-like regions of the polycrystal silicon thin-film transistor, in which [[the]] each of the island-like regions [[are]] is 1250 Å in thickness.

### Please replace the paragraph beginning at page 5, line 10 as with the following amended paragraph:

In Fig. 1, there has been found that an extremely excellent crystalline property is obtained when the plane area of each of the island-like regions is  $1000 \, \mu \text{m}^2$  or less.

### Please replace the paragraph beginning at page 5, line 13 as with the following amended paragraph:

Also, when the plane area of <u>each of</u> the island-like regions is  $1000 \mu m^2$  or less, the island-like regions may be of a square, a rectangle or other shapes.

## Please replace the paragraph beginning at page 5, line 16 as with the following amended paragraph:

Further, when the island-like regions are 1 [[ $\mu$ m]]  $\mu$ m<sup>2</sup> or more in plane area, the semiconductor is satisfactorily available as a device, and also it can be readily manufactured by a usual technique.

### Please replace the paragraph beginning at page 6, line 1 as with the following amended paragraph:

Under the above circumstances, the applicant has found that a plurality of <u>each of the</u> island-like regions, a plane area of which is  $1000 \, \mu m^2$  or less [[are]] is arranged in parallel to each other as active silicon layers that constitute the source region, the drain region and the channel formation region of a thin-film transistor so as to increase a substantial channel width, thereby being capable of obtaining a polycrystal thin-film transistor so as to increase a

Applicant: Isamu Kobori et al. Attorney's Docket No.: 07977-024004

Serial No.: New Divisional application

Filed : Herewith

Page : 4 of 10

substantial channel width, thereby being capable of obtaining a polycrystal thin-film transistor which allows a sufficient amount of current to flow therein, which has the channel formation region low in defect density, and which is high in performance.

#### Please replace the paragraph beginning at page 7, line 25 as with the following amended paragraph:

However, the applicant has found that even though the thickness of the amorphous silicon thin film is 1000 Å or more, more particularly 2000 Å to 10000 Å, if each of the island-like regions formed of the amorphous silicon thin film are set to 1000 µm<sup>2</sup> or less in area and then annealed for crystallization, a polycrystal silicon thin film is obtained which has no cracks and is lower in the defect density.

#### Please replace the paragraph beginning at page 10, line 24 as with the following amended paragraph:

The size of each of the respective island-like regions is 20 µm x 50 µm (width x length) in this example so that the area of the plane shape is set to 1000 µm<sup>2</sup> or less.

#### Please replace the paragraph beginning at page 11, line 9 as with the following amended paragraph:

In this example, the respective intervals between each of the adjacent island-like regions that form one thin-film transistor of the peripheral drive circuit portion was set to 4 µm.

#### Please replace the paragraph beginning at page 12, line 11 as with the following amended paragraph:

Thereafter, through the plasma CVD technique, a silicon oxide film [[407]] 406 that functions as a gate insulating film was formed at a thickness of 1500 Å.

Applicant: Isamu Kobori et al. Attorney's Docket No.: 07977-024004

Serial No.: New Divisional application

Filed : Herewith Page : 5 of 10

#### Please replace the paragraph beginning at page 12, line 14 as with the following amended paragraph:

On the silicon oxide film [[407]] 406, an aluminum film 6000 Å in thickness is formed through the sputtering technique and then patterned by etching, thereby forming gate electrodes 407 to 409.

## Please replace the paragraph beginning at page 13, line 21 as with the following amended paragraph:

Subsequently, contact holes 420 to 424 are formed in the first interlayer insulator 419, and electrodes/wirings 425 to 428 were formed using a multi-layer film made of metal material, for example, [[titan]] titanium 500 Å in thickness and aluminum 400 Å in thickness (Figs. 4C and 5C).

#### Please replace the abstract at page 19 with the following amended abstract:

A method of manufacturing a semiconductor characterized in that, in polycrystallizing an amorphous silicon thin film formed on a substrate through an annealing process, the amorphous silicon thin film has a plane area of  $1000~\mu\text{m}^2$  or less. A thin-film transistor characterized by comprising an active silicon film which is formed of a plurality of island-like regions arranged in parallel to each other, each of the island-like regions being formed of a polycrystal silicon thin film having a plane area of  $1000~\mu\text{m}^2$  or less. A method of manufacturing a thin-film transistor comprising the steps of:

forming an amorphous silicon thin film on a substrate; processing the amorphous silicon thin film into a plurality of island-like regions <u>each</u> having a plane area of  $1000 \, \mu m^2$  or less; polycrystallizing an amorphous silicon thin film that forms the island-like regions through an annealing process; and forming a thin-film transistor having at least one of the plurality of island-like regions as an active silicon layer.